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MORRISON & FOERSTER LLP
755 PAGE MILL RD
PALO ALTO, CA 94304-1018

EXAMINER

LEUNG, JENNIFER A

ART UNIT PAPER NUMBER

1764

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/992,786

Applicant(s)

BARNES, JOHN

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-146 is/are pending in the application.
- 4a) Of the above claim(s) 48-146 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 and 42-47 is/are rejected.
- 7) ☒ Claim(s) 41 is/are objected to.
- 8) ☒ Claim(s) 1-146 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 05/15/2002; 09/04/2002
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-47, in the reply filed on March 8, 2005 is acknowledged. Claims 48-146 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Information Disclosure Statement

2. The information disclosure statement (IDS) filed on May 15, 2002 fails to comply with 37 CFR 1.98(a)(2) because a copy of the cited non-patent literature publication as not been supplied. (i.e., Ref. No. 41., Ultra Low Emissions for Gas Turbines (2002) Xonon Cool Combustion by Catalytical Energy Systems Brochure, 4 pages). The IDS has been placed in the application file, but the cited reference has not been considered.

Drawings

3. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

4. The informal drawings are of sufficient quality to permit examination. However, formal replacement drawing sheets in compliance with 37 CFR 1.121(d) are now required.

5. The replacement sheets should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

6. Claims 6 and 41 are objected to because of the following informalities:

In claim 6, line 2, "lest" should be changed to --least--.

In claim 41, line 3, "couple" should be changed to --coupled--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, it is unclear as to the structural limitation applicant is attempting to recite by "at least two branched segments oriented about the center," as it is unclear as to what is meant by, "oriented about the center". Furthermore, it is unclear as to what is meant by "alternate consecutive struts".

Regarding claims 5, 6, 13 and 39, "the at least one strut" lacks proper positive antecedent basis, since "a plurality of struts" is set forth in claim 1.

Regarding claim 11, it is unclear as to the structural limitation applicant is attempting to recite by "each strut is adapted to react a load in an axial direction," as it is unclear as to what structural features enable each strut to react a load in an axial direction.

Regarding claim 18, it is unclear as to the structural limitation applicant is attempting to recite by, "the hub is adapted to receive a spindle for transferring a load," because it is unclear as

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to whether applicant considers “a spindle” to be part of the apparatus. The recitation that an element is “adapted to” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

Regarding claim 19, it is unclear as to the structural limitation applicant is attempting to recite by, “the hub is adapted to transfer a load to a second support structure located upstream,” because it is unclear as to what structural features enable the hub to transfer a load, and it is further unclear as to whether applicants consider “a second support structure” to be part of the apparatus. The recitation that an element is “adapted to” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

Regarding claims 42, 43, 45 and 47, “the outer containment” lacks proper positive antecedent basis, as it is merely recited in the intended use clause in the preamble of claim 1.

Regarding claim 46, “the at least a portion of distal ends” lacks proper positive antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5, 7, 9-11, 14-19, 25-34, 37, 38 and 42-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Downs et al. (GB 2 092 817).

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Regarding claims 1, 5, 7, 16, 17 and 29, Downs et al. (FIG. 1, 2; page 1, line 115 to page 2, line 109) discloses a support structure comprising:

a center defined by a hub (i.e., counting from the center of the hexagonal structure, the first ring **4**; see FIG. 1, 2);

at least two branched segments oriented about the center (i.e., as shown, six segments, as defined by the six sides of the structure) and encompassed by an outer perimeter defined by an outer ring (i.e., counting from the center of the hexagonal structure, the fourth ring **4**), wherein each segment includes:

a plurality of struts (i.e., radial, straight webs **22**); each strut **22** having a proximal end (i.e., extending towards first ring **4**) and a distal end (i.e., extending towards fourth ring **4**);

wherein the proximal end of one strut (i.e., a first web **22**, extending between the first ring **4** and the second ring **4**) is connected to the center and each consecutive strut (e.g., a next web **22**, extending between the second ring **4** and the third ring **4**) is connected to the previous strut at the proximal end of the consecutive strut, such that alternate consecutive struts are substantially parallel to each other (see FIG. 1, 2).

Regarding claim 2, the distance defined between alternate consecutive struts **22** is substantially constant (see FIG. 1, 2).

Regarding claim 3, at least one consecutive strut **22** of one branched segment is parallel to at least one consecutive strut **22** of another branched segment (see FIG. 1, 2).

Regarding claim 4, the outer perimeter substantially defines a circle (see FIG. 1, 2).

Regarding claims 9 and 10, consecutive struts **22** are connected to previous struts **22** at a distance from the proximal end of the previous strut, wherein the distance is constant (FIG. 1, 2).

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Regarding claim 11, as best understood, the support structure of Downs et al. meets the claims, since no further structural limitations are recited.

Regarding claims 14 and 15, each consecutive strut **22** is connected to the previous strut **22** at a constant angle located between the distal end of the previous strut and the distal end of the consecutive strut, throughout the branched segment (i.e., a 90 degree angle; see FIG. 1, 2).

Regarding claims 18 and 19, the hub (i.e., the first ring **4**; FIG. 1, 2) is adapted to receive a spindle (i.e., a cylindrical fuel rod **1**) and transfer a load to a second support structure located upstream (e.g., “fuel rods which are arranged and supported by grids which are spaced axially along the fuel assembly,” page 1, lines 7-15).

Regarding claims 25-28, Downs et al. discloses a strut **22** may be connected to the center (i.e., the first ring **4**) with a slip joint (i.e., a tongue and groove joint; see FIG. 8; page 2, lines 97-105), wherein the proximal end of the strut **22** includes at least one tongue **30**, and the center (i.e., flat strap **3**, defining ring **4**) includes at least one slot (i.e., groove **31**) adapted to receive the at least one tongue **30**. Similarly, at least one consecutive strut **22** is connected to the previous strut **22** with a slip joint.

Regarding claims 30 and 31, Downs et al. discloses the outer ring (i.e., the fourth ring **4**) includes a plurality of peaks and troughs formed substantially in the radial direction (i.e., as defined by corrugated strap **10**), wherein the distal ends of struts **22** are connected to the outer ring at the troughs (see FIG. 2).

Regarding claim 32, Downs et al. discloses the strut **22** connected to the center (i.e., the first ring **4**) or at least one consecutive strut **22** is coupled to the outer ring (i.e., the fourth ring **4**) with a slip joint (i.e., a tongue and groove joint; see FIG. 8; page 2, lines 97-105).

Regarding claims 33, 34, 44 and 45, Downs et al. (FIG. 8; page 2, lines 97-105) discloses the distal end of at least one strut **22** includes a flange (i.e., tongue **30**), wherein an outer ring or containment comprises an expansion slot (i.e., groove **31**, of the fourth ring **4**, defined by a strap **3**), the flange **30** being received within the expansion slot **31**.

Regarding claims 37 and 38, the distal end of at least one strut **22** includes slot (i.e., a groove, located between the two tongues **20**), wherein the outer ring (i.e., the fourth ring **4**, defined by a strap **3**) is passed through the slot (i.e., at the portion located between the two grooves **31**; see FIG. 8; page 2, lines 97-105).

Regarding claims 42 and 43, at least a portion of the distal ends of struts **22** are connected to the outer containment (i.e., to the fourth ring **4**) with a slip joint (i.e., a tongue and groove joint; see FIG. 8; page 2, lines 97-105).

Instant claims 1-5, 7, 9-11, 14-19, 25-34, 37, 38 and 42-45 structurally read on the apparatus of Downs et al.

9. Claims 1-16, 20-24, 29 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by Humpolik (US 5,342,588).

Regarding claims 1, 4, 5 and 16, Humpolik (FIG. 1a, 1b, 2a, 2b, 3a, 3b, 4a, 4b, 5a, 5b; column 3, lines 5 to column 4, line 14) discloses a support structure comprising:

a center (i.e., stationary point of symmetry **8**);

at least two branched segments (i.e., two branches, as divided by plane **E—E**) oriented about the center **8** and encompassed by an outer perimeter (i.e., at jacket **2**, substantially defining a circle), wherein each branched segment includes:

a plurality of struts (i.e., substantially radial stacks **3**); each strut **3** having a proximal end

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(i.e., extending to stationary point 8) and a distal end (i.e., extending outward, to jacket 2);

wherein the proximal end of one strut (e.g., counting clockwise from the top, the first stack 3) is connected to the center 8 and each consecutive strut (i.e., counting clockwise from the top, the second stack 3) is connected to the previous strut at the proximal end of the consecutive strut (i.e., the proximal end of the second stack 3 is connected to the first stack 3, at intersection 6) such that alternate consecutive struts are substantially parallel to each other (e.g., counting clockwise from the top, the first and third stacks 3 are substantially parallel to each other; also, the second and fourth stacks 3 are substantially parallel to each other).

Regarding claim 2, the distance defined between alternate consecutive struts (i.e., alternate consecutive stacks 3) is substantially constant. (See FIG. 1a, 1b, 2a, 2b).

Regarding claim 3, at least one consecutive strut of one branched segment (e.g., counting clockwise from the top, the first stack 3) is parallel to at least one consecutive strut of another branched segment (i.e., counting clockwise from the top, the third stack 3).

Regarding claims 6 and 8, at least one strut or consecutive strut includes at least one bend (i.e., stacks 3 are shown with bends in FIG. 1a, 2a).

Regarding claim 7, at least one consecutive strut is straight (i.e., stacks 3 are shown straight in FIG. 1b, 2b).

Regarding claims 9-10, Humpolik discloses that each consecutive strut 3 may be connected to the previous strut 3 at a distance from the proximal end of the previous strut 3, wherein the distance is constant. (i.e., counting clockwise from the top, the second stack 3 is connected to the first stack 3 at a distance from the proximal end of the first stack 3; See FIG. 3a, 3b, 4a, 4b, 5a, 5b; column 3, line 53 to column 4, line 14).

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Regarding claim 11, as best understood, the support structure of Humpolik meets the claims, since no further structural limitations are recited.

Regarding claim 12, at least one strut includes an elbow (i.e., stacks 3 are shown with elbows, or bends; see FIG. 1a, 2a).

Regarding claim 13, at least one strut (i.e., a stack 3) includes an elbow (i.e., a bend) such that its distal end is substantially perpendicular to the perimeter 2 (see FIG. 2a).

Regarding claims 14 and 15, each consecutive strut 3 is connected to the previous strut 3 at a constant angle (i.e., as shown in FIG. 1a, 1b, 2a and 2b, about a 90 degree angle) located between the distal end of the previous strut and the distal end of the consecutive strut.

Regarding claims 20-24, Humpolik discloses that at least one strut 3 is corrugated (i.e., with corrugations 4; FIG. 1b) and connected to the center 8 or another strut 3, wherein the sheet metal layers 4, 5 of the metal support matrix overlap and are connected together using a method known in joint-forming technology, preferably by soldering.

Regarding claims 29 and 42, jacket 2 defines an outer ring that encompasses the branched segments (FIG. 1a, 2a), wherein at least a portion of the distal ends of struts 3 are connected to the outer ring 2 (column 3, lines 35-40).

Instant claims 1-16, 20-24, 29 and 42 structurally read on the apparatus of Humpolik.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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10. Claims 35, 36, 39-40, 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Downs et al. (GB 2 092 817) in view of Piepers et al. (US 3,889,438).

Regarding claims 35, 36, 46 and 47, Downs discloses that the distal end of at least one strut **22** may be connected to the outer ring (i.e., the fourth ring **4**) with a slip joint (FIG. 8; page 2, lines 97-105). However, Downs et al. is silent as to the joint comprising at least two notches to form a T-end, wherein the outer ring includes an expansion slot for receiving the T-end. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute a joint comprising a T-end and expansion slot for the slip joint of Downs, on the basis of suitability for the intended use thereof, because the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). Piepers et al. (FIG. 1-3; column 2, line 55 to column 3, line 18) teaches a conventionally known means for joining a plurality of struts (i.e., crossband **1** and crossband **2**), wherein the means comprises a joint including a T-end (i.e., crossband **1** comprises at least two notches **7**, **8** to form a T-end, as defined by lips **3** and **4**; FIG. 1), wherein the T-end is received in an expansion slot (i.e., a cavity **8** and incision **9** of crossband **2**; FIG. 2).

Regarding claims 39-40, Downs discloses that the strut **22** may be connected to the center (i.e., the first ring **4**) and a previous strut **22** with a butt joint, wherein the strut **22** is resistance-welded at points **26** and welded by electron beam or other method at contact line **27** (FIG. 7; page 2, lines 93-96). However, Downs et al. is silent as to joint comprising a braze lug. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute a joint comprising a braze lug for the butt joint of Downs, on the basis of

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suitability for the intended use thereof, because the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). Piepers et al. (FIG. 1-3; column 2, line 55 to column 3, line 18) teaches a conventionally known means for joining a plurality of struts (i.e., crossband 1 and crossband 2), wherein the means comprises a joint including at least a braze lug (i.e., lips 3, 4, 13).

Allowable Subject Matter

11. Claim 41 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not disclose or adequately teach a support structure wherein the struts are connected to the center or a previous strut using the instantly claimed braze lug that includes at least two flanges, a strut receiving portion coupled to the at least two flanges, at least two tabs coupled to the at least two flanges, and at least one tab coupled to the strut receiving portion.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

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Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung

May 28, 2005



**HIEN TRAN
PRIMARY EXAMINER**